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Comunicaciones

USER MANUAL OF UMTS ICS PICO REPEATER

CONTENT

1. Product Introduction 3
2. Usage scope 4
3. Characteristics 5
4. Specifications 6
5. Product Description 8
6. Installation instructions 9
7. Indicator Instruction Table 10
8. Local Setup steps 12
9. National restrictions 14
10. Declaration of Conformity 15
11. Contact Details 16

1. PRODUCT INTRODUCTION

The ICS Pico Repeater provides an affordable solution to solve the indoor signal coverage problems in UMTS system due to signal fading and attenuation caused by architecture obstacles. And its easy installation and maintenance can help carrier get fast return.

The Pico-repeater is working as a relay between the BTS and mobiles. The UMTS ICS Pico is micro-power digital wireless repeater, with its interference cancellation system (ICS) feature, it can provide UMTS signal for offices, meeting rooms , houses , and a variety of other indoor space. The device is compact, easy to install, is the most simple and quick way for operators to improve the signal. The UMTS ICS Pico realizes function of LNA, frequency conversion, A/D, D/A, RF amplification, DSP, IF filter, and it reduces the isolation requirement by adopting digital self-adaptive technology; the equipment has built-in donor antenna and service antenna. At the same time, it provides a RF port for external donor antenna connection in order to accommodate with the case which is not suitable for built-in donor antenna.

Pico Repeater can be deployed in indoor coverage. It is especially advantageous to use in 100-500sq.m, which is a very economical solution.

2. USAGE SCOPE

To expand signal coverage or fill signal blind area where signal is weak or unavailable.

residential house	villas
offices	Paramount offices
meeting rooms	boardroom
border	village
Hotels	vessels
high-buildings	tunnels
countryside	mines
Clubs	underground facilities

FIGURE 1 APPLICATION DIAGRAM

3. CHARACTERISTICS

AUTOMATIC LEVEL CONTROL FUNCTION

With the function of digital ALC, the dynamic gain adjustment range is more than 20dB. It ensures the Pico Repeater works in linear status and provides the high reliability and stability.

REAL TIME INTERFERENCE SIGNAL CANCELLATION (MULTI-PATH FADING, FEED-BACK SIGNAL) GREATLY REDUCES SYSTEM ISOLATION REQUIREMENT

It has the function of Real Time Interference Signal Cancellation, which detects the isolation between the donor antenna and service antenna, and then base on the isolation to automatically set the corresponding gain, and greatly reduces system isolation requirement.

UPLINK/DOWNLINK GAIN ADJUSTMENT SYNCHRONIZATION UPLINK AND DOWNLINK GAIN SETUP AUTOMATICALLY

After the system is powered up, the input power is detected automatically and then the output power is adjusted. After the downlink gain is calculated by the system, the uplink gain can be adjusted equivalently. This method can balance the system amplification. The both path gain is adjusted relevantly. The system gain is less than the system path loss. So the Pico Repeater will not bring any interference and noise into the system link. One base station can hook up more than one Pico Repeater.

4. SPECIFICATIONS

Items		Specifications
Working Frequency (customized)	**Uplink**	1920-1980 MHz
	Downlink	2110-2170 MHz
Maximum Output power		15dBm
Gain Max		75dB
Gain Adjustment Range		0~30 dB @ step of 1 dB
ALC		≥ 15dB
Noise Figure		≤ 2.0
In-band Ripple		≤ 3dB@3.84MHz
No. of Channels		Any continuous three carries within 60MHz BW
Interference Cancellation Range		≥ 30dB(Antenna Isolation + 15dB)
Out of Band Gain		2.7 ≤ f offset < 3.5 MHz ≤ 60dB 3.5 ≤ f offset < 7.5 MHz≤ 45dB 7.5 ≤ f offset < 12.5 MHz≤ 45dB 12.5 ≤ f offset≤ 35dB
Frequency Error		≤ 0.01ppm
Error Vector Magnitude (EVM)		≤ 12.5%
Peak Code Domain Error (PCDE)		≤ -35dBm
ACRR		20dB@±5MHz 20dB@±10MHz
Voltage Standing Wave Ratio		≤ 2.0
Non Damage Input Level		≤0dBm

Spurious Emission	Comply with 3GPP TS 25.106 V6.0.0
Third-order Inter-Modulation	max.-40dBc
System Delay	≤ 8μSec
I/O Impedance	50Ω
RF Connector	SMA-Type (Female)
Temperature Range	Operation: -10°C ~ + 50°C
Dimensions	270mm *210mm * 65mm
Power Supply (customized)	90~240VAC 50Hz/60Hz
Antenna port	Built-in antenna for both donor port and service port

5. PRODUCT DESCRIPTION

APPEARANCE

FIGURE 2 FRONT VIEW OF REPEATER

FIGURE 3 SIDE VIEW OF REPEATER

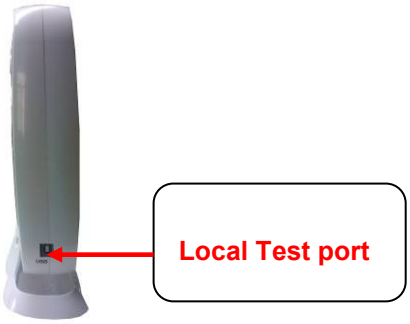


FIGURE 4 SIDE VIEW OF REPEATER

6. INSTALLATION INSTRUCTIONS

1) It supports vertical mounting installation, follow the instructions below.

FIGURE 5 MOUNTING DIAGRAM

a. First of all, choose a mounting position for the Pico Repeater in indoor environment, the mounting base is flat in horizontal plane; it can be placed on the windowsill vertically.

b. LCD screen side must face the open area of coverage area.

c. Built-in door antenna and coverage antenna

d. Equipment is supplied by AC220V power via connection of the external extension power cable.

e. USB port is used for Local setup.

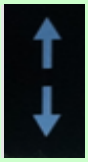
f. GSM system can automatically search frequency (Channel No) and it takes 3-5 minutes to complete; UMTS systems need manual set as required.

7. INDICATOR INSTRUCTION TABLE

THE LED INDICATORS

LCD VIEW

LCD DISPLAY INSTRUCTIONS

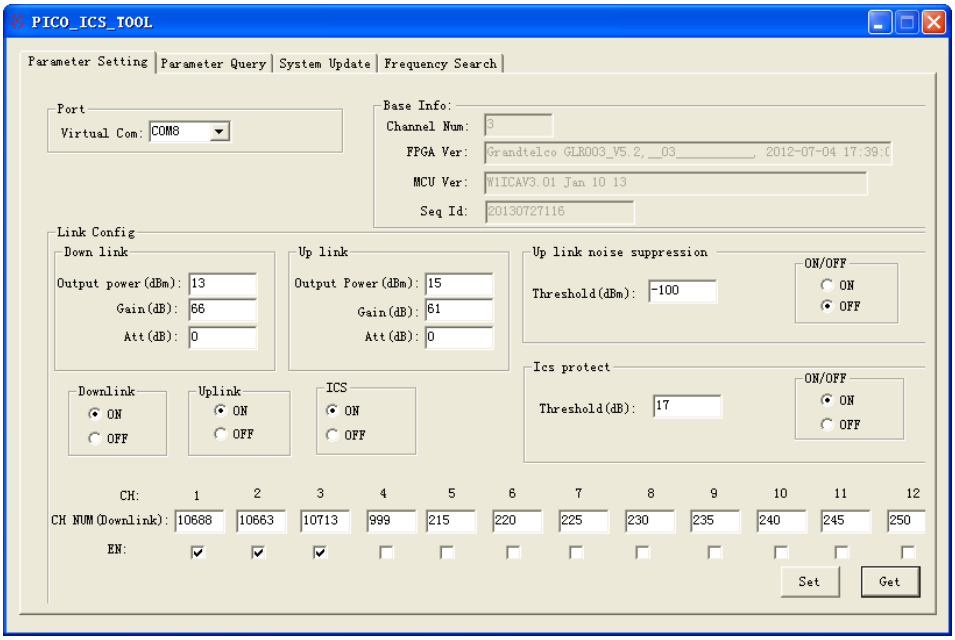
LCD display content	**Instructions**	***Remark***
	The left progress bar has 6 bars: When the module is powered on, the progress bar will be cycle rolling, it means the module is starting; After module starts, the progress bar shows RSSI of downlink; If module fails to start, the total 6 bars of progress bar will lighten and blink, it shows alarm	Downlink signal strength indication range : 0 bar：*≤-110dBm；* 1 bar：*-110~-101dBm;* 2 bar：*-100~-91dBm;* 3 bar：*-90~-81dBm;* 4 bar：*-80~-66dBm;* 5 bar：*-65~-51dBm;* *6* bar：*≥-50dBm;*
	Uplink and downlink indicator: Up arrow means uplink, the data on this row is for uplink Down arrow means downlink, the data on this row is for downlink	When the PICO is off due to very high temperature(>), the arrows will be blinking
	Input power value: First value (-95) means input power level of uplink (value range:0~-99) Second value (-89) means input power level of downlink (value range:0~-99)	When input signal is too weak (< -90 dBm), “INPUT” icon will be blinking

	Gain value: First value (69) means working gain of uplink (value range:0~-99) Second value (74) means working gain of downlink (value range:0~-99)	
	Isolation value: First value (57) means environmental isolation value of uplink (value range:0~-99) Second value (63) means environmental isolation value of downlink (value range:0~-99)	When the isolation value cannot meet requirement of PICO working, the “isolation” icon will be blinking
	The right progress bar has 6 bars: For GSM system, the progress bar will be cycle rolling when searching the working channels after the module starts; it will blink if it fails for searching The progress bar shows current status of working environment, it can work normally only if it displays more than 2 bars after repeater initialization(power on); Then the gain in the LCD display keeps this consistent original value for reference	Current status of working environment shows the difference between PICO gain value and environmental isolation value (Gain-Isolation) after Repeater initialization 0 bar: > 25 dB: Current environment is not suitable for working 1 bar: 19~ 25 dB: Cannot setup call 2 bar: 16~ 20 dB: Can setup call 3 bar: 11~ 15 dB: 4 bar: 6~ 10 dB: 5 bar: 0~ 5 dB:

8. LOCAL SETUP STEPS

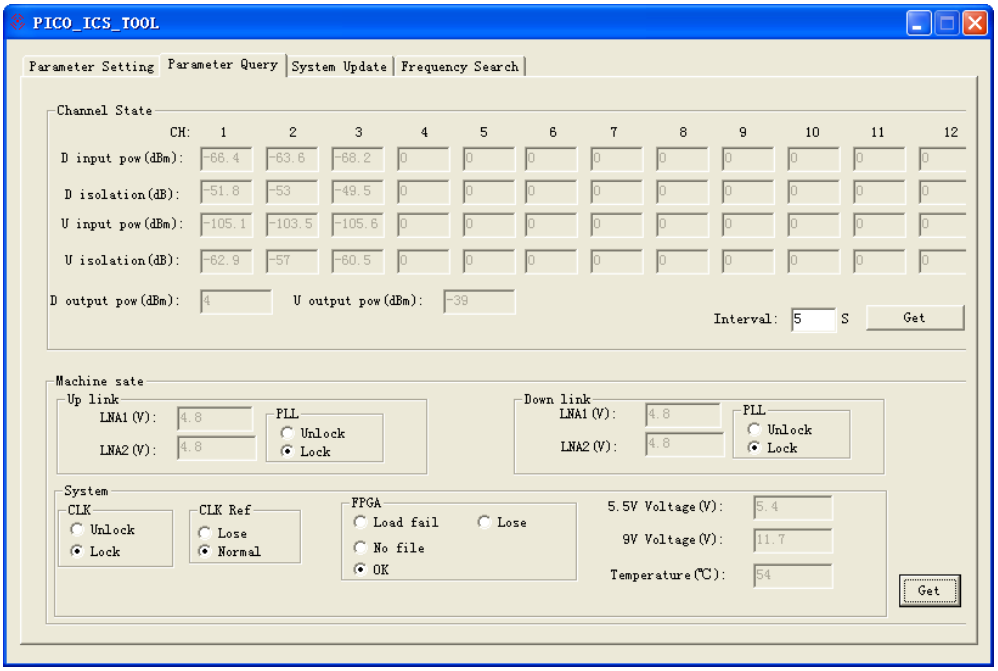
Connect your laptop to the repeater via the data cable. Do the following steps:

a. Startup the Local Test Program(PICO_ICS_TOOL), Click on the **Parameters Setting** tab, Setting **com** port,and then click **Get** button, you can pick up all data from this page. Set the **CH NUM(Downlink)** as required(Other parameters have been set in factory).



Tick the EN, Set the CH NUM(Downlink) according to which carries you need to activate, and you can set up to any continuous three carries within 60MHz of UMTS band, setting frequency beyond UMTS band will cause failure to set parameters in the "Parameter Setting" table. The Gain is adjusted automatically according to isolation

b. Click on the **Parameters Query** tab, you can check the input power /output power and Isolation of repeater.



9. NATIONAL RESTRICTIONS

ENGLISH - NATIONAL REGULATIONS

Installation and usage of this product inside the European Union is subject to regulation as set in the 1999/05/CE (R&TTE) directive.

The exclamation mark ⓘ (Alert) included in the approval symbol warns you that national regulations are in force relating to the permissible frequencies and registration formalities. Please be sure to observe the national regulations which apply in your country. An individual license may be required to install and operate this device in your country.

DEUTSCH – NATIONALE VORSCHRIFTEN

Für den Marktzugang von Sendefunkanlagen in der europäischen Gemeinschaft gelten die Vorschriften der R&TTE Richtlinie 1999/05/CE (R&TTE).

Die Kennzeichnung der Produkte erfolgt mit dem CE-Zeichen. Das auf der Kennzeichnung abgebildete “Achtung” (Alert) ⓘ Symbol weist Sie auf nationale Vorschriften bezüglich der verwendbaren Frequenzen und eventuelle Anmeldeformalitäten hin. Bitte beachten Sie die nationalen Vorschriften Ihres Landes. Zur Installation und Betrieb der Funkanlage ist vom jeweiligen Netzbetreiber (Lizenzinhaber) eine Genehmigung zu beantragen.

FRANÇAIS - LÉGISLATIONS NATIONALES

Les nouvelles directives R&TTE (Directive R&TTE 1999/05/CE) relatives à la commerciaisation d’émetteurs radios dans la communauté européenne sont applicables.

Les produits portent le marquage CE. Le symbole “Attention” (alerte) ⓘ , se rapport aux législations nationales en vigueur relatives à l’utilisation des fréquences autorisées et les formalités éventuelles de déclaration. Pour l’utilisation, respectez la législation en vigueur dans votre pays.

ITALIANO - REGOLAZIONI NAZIONALI

L’installazione ed uso di questo prodotto dentro l’Unione Europea sta soggetto a regolazione secondo quello specificato nel direttivo 1999/05/CE (R&TTE).

Il simbolo di esclamazione “All’erta” ⓘ compreso nel simbolo di approvazione CE lo nota che le regolazioni nazionali stanno in compimento relazionato con le frequenze permissibili e formalità di registro. Per favore assicuri Lei di osservare le regolazioni nazionali che sono applicabili nel suo paese. Una licenza individuale potrebbe essere richiesta per operare questo dispositivo nel suo territorio.

10. DECLARATION OF CONFORMITY

CommWays

DECLARATION OF CONFORMITY

We, **ACTION TECHNOLOGIES CO., LIMITED**

of **3/F, Lifeng Building, 42# of Liuxian 1st Road ,Bao'an 71st District ,Shenzhen,China**

declare under our sole responsibility that the product

Type Designation : **SPRI15-U**

Description of Equipment : **UMTS2100 Single Band ICS Pico Repeater**

Intended Use : **Cellular Land Mobile Radio Networks**

to which this declaration relates, is in conformity with the following standards and/or other normative documents :

EN 600950-1:2006 + A11:2009

EN 62311:2008

ETSI EN 301 908-3 **ETSI TS 125 106**

ETSI TS 125 143 **ETSI TS 125 113 V11**

We hereby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all essential requirements of Directive 1999/5/EC.

The conformity assessment procedure referred to in Article 10(5) and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body :

PHOENIX TESTLAB GmbH, Königswinkel 10, D-32825 Blomberg, Germany

Identification mark : **0700** The equipment will also carry the Class 2 equipment identifier ⓘ

The technical documentation relevant to the above equipment can be made available for inspection on application to :

Company name :	ACTION TECHNOLOGIES CO., LIMITED
Address :	3/F, Lifeng Building, 42# of Liuxian 1st Road ,Bao'an 71st District ,Shenzhen,China
Legal Representative name :	Liu Dehong
Title :	General Manager
Signature :	
Date :	Mar.03.2014

11. CONTACT DETAILS

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Pico Repeater User Manual

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